

2  
METRIC WEIGHTS AND MEASURES

AND

OTHER TABLES

PREPARED FOR THE USE OF

THE PHOTOGRAPHIC AND LITHOGRAPHIC OFFICES,  
SURVEY OF INDIA,

UNDER THE DIRECTION OF

COLONEL H. R. THUILLIER, R.E.,  
SURVEYOR GENERAL OF INDIA,

BY

COLONEL J. WATERHOUSE, B.S.C.,  
ASSISTANT SURVEYOR GENERAL OF INDIA,

ASSISTED BY

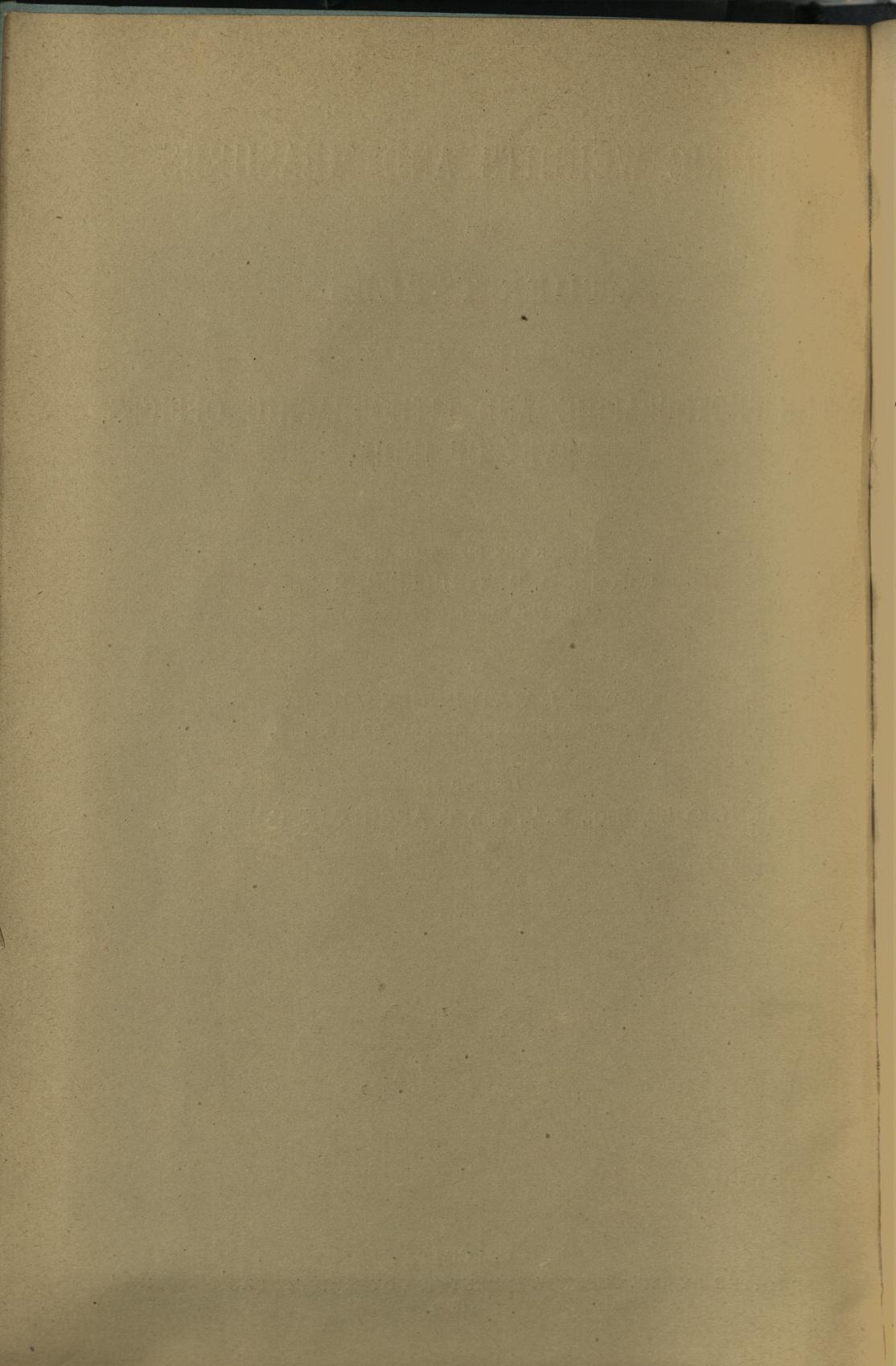
W. H. COLE, ESQ., M.A., AND T. ARCHDALE POPE, ESQ.,  
SURVEY OF INDIA.



CALCUTTA :

PRINTED BY THE SUPERINTENDENT OF GOVERNMENT PRINTING, INDIA.

1889.



The Photographic Society of Great Britain  
from Col. Waterhouse - 07

# METRIC WEIGHTS AND MEASURES

AND

## OTHER TABLES

PREPARED FOR THE USE OF

THE PHOTOGRAPHIC AND LITHOGRAPHIC OFFICES,  
SURVEY OF INDIA,

UNDER THE DIRECTION OF

COLONEL H. R. THUILLIER, R.E.,  
SURVEYOR GENERAL OF INDIA,

BY

COLONEL J. WATERHOUSE, B.S.C.,  
ASSISTANT SURVEYOR GENERAL OF INDIA,

ASSISTED BY

W. H. COLE, ESQ., M.A., AND T. ARCHADE POPE, ESQ.,  
SURVEY OF INDIA.



CALCUTTA:

PRINTED BY THE SUPERINTENDENT OF GOVERNMENT PRINTING, INDIA.  
1889.

THEATRICAL WEIGHTS AND UNWEIGHTS

OTHER TABLES

THE DIALECTICAL AND THE LOGICAL FORMS  
OF THE SUBLIMINAL AND THE SUPERFLUOUS

COLONIAL FEDERAL JOURNAL  
A QUARTERLY OF LITERATURE

COLONIAL FEDERAL JOURNAL  
A QUARTERLY OF LITERATURE

COLONIAL FEDERAL JOURNAL

COLONIAL FEDERAL JOURNAL

# METRIC WEIGHTS AND MEASURES

AND

## OTHER TABLES

PREPARED FOR THE USE OF

THE PHOTOGRAPHIC AND LITHOGRAPHIC OFFICES,  
SURVEY OF INDIA.

### Metric Tables.

The metric system of weights and measures having been adopted in the Photographic Office for convenience in keeping the store accounts, the following tables for the conversion of these measures to British and *vice versa* will be found useful.

They have been based on the relative equivalents of the metric and British systems given in Schedule III of the Weights and Measures Act of 1878, and have been compiled from De la Rue's Tables and other sources.

As the metric system is now ordinarily used in scientific publications, the scope of the tables has been extended so as to meet, as far as possible, the ordinary requirements of general and scientific reference.

### Use of the Tables.

The number required to be converted, whether British or metric, may either be multiplied directly by the decimal fraction representing the equivalent value of one unit of the required denomination, as found in the tables of equivalents or multipliers, according to the accuracy required; or, it may be broken up into a series of constituent parts in thousands, hundreds, tens, units and fractions, and the equivalents of the several amounts, as found from the tables of multipliers, added together. In the latter case care must be taken to change the position of the decimal point as required for multiples or fractions of the unit.

This will be best illustrated by examples.

Supposing it be desired to find the equivalent of 645.15 litres in pints.

By the first method 645.15 is multiplied by the equivalent of 1 litre in pints = 1.76077, giving a product of 1135.961.

By the second method the total number of litres may be broken up as follows :—

600.00 litres	=	1056.462 pints.
40.00	,	70.431
5.00	,	8.804
0.10	,	0.176
0.05	,	0.088
<hr/>		<hr/>
645.15		1135.961

Adding together the equivalents of the constituent parts in pints the same total is obtained.

Conversely :—Supposing it be desired to find the equivalent of 3 cwt. 25lb 14½ ounces in kilogrammes, the whole sum may be reduced to ounces and multiplied by .02835, the equivalent of 1 ounce in kilogrammes, thus :—

$$5790.50z \times .02835 = 164.161 \text{ kilos.}$$

But in this case the result will be more accurately and simply obtained by finding the metric equivalents of the separate items of British measure from the tables, and adding them together, thus :—

3 cwt.	=	152.407 kilos.
20 lb	=	9.072 "
5 lb	=	2.268 "
10 oz.	=	0.283 "
4 oz.	=	0.113 "
0.5 oz.	=	0.014 "
<hr/>		<hr/>
TOTAL	.	164.157 "

In some cases the first method will be the simplest and in others the second. The tables of multipliers show only 3 places of decimals, and therefore, if greater accuracy be required, especially in the first method, a longer fraction of at least 5 places of decimals should be taken from the tables of equivalents.

NOTE.—The value of the metre given in the Table I = 39.37079 inches, *in vacuo*, at Sea-level, was determined by Captain Kater in 1818, the temperature of the standard yard being 62° F. and of the metre 32° F. It has since then been recognised as the authoritative legal equivalent of the metre in British measure and still remains so.

In the course of his comparison of the standards of length of various countries, made at the Ordnance Survey Office, Southampton, in 1865, Captain A. R. Clarke, R.E., determined the true length of the legal equivalent of the metre under the above conditions of temperature to be 1093602311 yards = 328086933 feet = 39.37043196 inches (see "Comparison of the Standards of Length," p. 280).

By this valuation the corresponding equivalents of British Measures of Length in Metric Measures are :—

1 inch	=	2.5399772 centimetres.
1 foot	=	30.4797264 "
1 yard	=	91.4391792 "
1 mile	=	1.0093296 kilometre

(as given in the Survey of India "Auxiliary Tables").

Captain Clarke further determined the correct British equivalent of the *Scientific* metre or the length of the ideal theoretical metre, being the 10-millionth part of the quadrant of the Meridian passing through Paris, to be 39'377786 inches, or, reduced to the same standard of temperature as the legal metre, 39'376229 inches.

As stated above, in fixing the equivalent of the legal metre, the lengths of the standards were compared at their normal temperature, *viz.*,  $32^{\circ}$  for the metre and  $62^{\circ}$  F. for the standard yard. The Standards Commissioners recommended in 1871 that, for commercial purposes, it was desirable that the comparison of the two standards should be made at the same ordinary temperature of the air at  $62^{\circ}$  F. According to this valuation the length of a brass metre would be 39'380203 inches.

Table II is based on the determination by Prof. W. H. Miller, in 1844, of the weight of the French Kilogramme des Archives, *in vacuo*, to be equal to 15432'34874 imperial grains, or 2'20462125 standard platinum pounds (avoirdupois).  
Under the Weights and Measures Act of 1878

The Troy pound has now almost become obsolete. Under the Weights and Measures Act of 1970, avoirdupois weight is to be used exclusively for all articles sold by weight, except for bullion and precious stones, which may be sold by the Troy ounce or by decimal parts of it, and for drugs which may be sold by retail by apothecaries' weight. In the latest editions of the British Pharmacopoeia the only weights used are the grain, avoirdupois ounce (437.5 grains) and pound (7000 grains). Photographic and chemical formulae are commonly prepared according to Apothecaries' or Troy grains, drachms and ounces, but the use of Avoirdupois and Metric Weights for this purpose is fast extending.

The tables have been carefully revised in the Trigonometrical Branch office by Mr. W. H. Colle, M.A., Deputy Superintendent of Survey.

## I.—Measures

## Metric to

The fundamental unit of Metric Length and Weight is the METRE, assumed to be the 10-standard metre at its normal temperature of  $32^{\circ}$  F. is 39'37079

		Inches.	Feet.	Yards.
Millimetre	= 1000 metre	= 0'03937	0'00328	0'00109
Centimetre	= 100 "	= 0'39371	0'03281	0'01094
Decimetre	= 10 "	= 3'93708	0'32809	0'10936
METRE	= unit	= 39'37079	3'28090	1'09363
Decametre	= 10 metres	= 393'70790	32'80899	10'93633
Hectometre	= 100 "	= 3,937'07900	328'08992	109'36331
Kilometre	= 1,000 "	= 39,370'79900	3,280'89917	1,093'63306
Myriametre	= 10,000 "	= 393,707'99000	32,808'99167	10,930'3056

One Mieron ( $\mu$ ) (p. micra), = one-thousandth of a millimetre =  $10^{-6}$  millimetre = 0.000039 inch.

## MULTI

	Millimetres to			Centimetres to		
	Metres.	Inches.	Feet.	Metres.	Inches.	Feet.
1	0'001	0'03937	0'00328	0'01	0'3937	0'0328
2	0'002	0'07874	0'00656	0'02	0'7874	0'0656
3	0'003	0'11811	0'00984	0'03	1'1811	0'0984
4	0'004	0'15748	0'01312	0'04	1'5748	0'1312
5	0'005	0'19685	0'01640	0'05	1'9685	0'1640
6	0'006	0'23622	0'01969	0'06	2'3622	0'1969
7	0'007	0'27560	0'02297	0'07	2'7560	0'2297
8	0'008	0'31497	0'02625	0'08	3'1497	0'2625
9	0'009	0'35434	0'02953	0'09	3'5434	0'2953
10	0'010	0'39371	0'03281	0'10	3'9371	0'3281

## British to

		Millimetres,	Centimetres,
12 inches	= 1 foot	= 25'39954	2'53995
3 feet	= 1 yard	= 304'79449	30'47945
2 yards	= 1 fathom	= 914'38348	91'43835
5½ "	= 1 pole or perch	= 1,828'76666	182'87670
40 poles	= 1 furlong	= 5,029'10914	502'91001
8 furlongs	= 1 mile	= 201,164'36576	20,116'43658
		= 1,609,314'92612	160,931'49201

1 chain = 20'11644 Metres. 1 Geographical mile = 1'1527 Statute miles = 1,855'052 metres. 1 degree = 1 mil =  $\frac{1}{1000}$  inch = 0'254 m.m.

## MULTI

	Inches to			Feet to		
	Millimetres.	Centimetres.	Decimetres.	Centimetres.	Decimetres.	Metres.
1	25'3995	2'54	0'254	30'479	3'048	0'305
2	50'7991	5'08	0'508	60'957	6'096	0'610
3	76'1986	7'62	0'762	91'438	9'144	0'914
4	101'5983	10'16	1'016	121'918	12'192	1'219
5	126'9977	12'70	1'270	152'397	15'240	1'524
6	152'3972	15'24	1'524	182'876	18'288	1'828
7	177'7968	17'78	1'778	213'356	21'336	2'134
8	203'1963	20'32	2'032	243'835	24'384	2'438
9	228'5959	22'86	2'286	274'315	27'432	2'743
10	253'9954	25'40	2'540	304'794	30'479	3'048

1 inch = 25,399'54 micra.  $\frac{1}{1000}$  inch = 253'995 micra.

## Fractions of an Inch to Millimetres.

$\frac{1}{16}$	= 1'26998	$\frac{1}{15}$	= 2'54000	$\frac{1}{10}$	= 0'8467
$\frac{1}{16}$	= 8'4665	$\frac{1}{14}$	= 4'2333	$\frac{1}{9}$	= 2'1166
$\frac{1}{16}$	= 16'9330	$\frac{1}{13}$	= 3'6285	$\frac{1}{8}$	= 1'5875
$\frac{1}{16}$	= 6'3490	$\frac{1}{12}$	= 3'1749	$\frac{1}{7}$	= 1'2700
$\frac{1}{16}$	= 19'0497	$\frac{1}{11}$	= 2'8222	$\frac{1}{6}$	= 1'0100
				$\frac{1}{5}$	= 0'5080
				$\frac{1}{4}$	= 0'2540
				$\frac{1}{3}$	= 0'7937
				$\frac{1}{2}$	= 0'6350
				$\frac{1}{1}$	= 0'3080

## of Length.

## British.

millionth part of the quarter of the earth's meridian. The legal British equivalent of the inches, of the British standard yard at the temperature of  $62^{\circ}$  F.

Furlongs,	Miles,	Miles,	Furlongs,	Yards,	Feet,	Inches,
...	...	= 0	0	0	0	about $\frac{1}{6}$
0'00005	0'00005	= 0	0	0	0	$\frac{2}{5}$
0'00050	0'00050	= 0	0	0	0	3 $\frac{9}{10}$
0'00497	0'00062	= 0	0	1	0	3 $\frac{9}{10}$
0'04971	0'00621	= 0	0	10	2	2 $\frac{3}{5}$
0'49711	0'06214	= 0	0	109	1	9 $\frac{1}{10}$
4'97106	0'62138	= 0	4	213	1	1 $\frac{3}{5}$
49'71059	6'21382	= 6	1	150	0	9 $\frac{9}{10}$

One micro-millimetre ( $\mu$ .) = one-millionth of a millimetre or about 0'0000004 of an inch.

## PLIERS.

Metres	to	Yards,	Feet.	Yards.	Kilometres	to	Miles,
Inches,	Feet,	Yards,	Feet.	Yards.	Inches,	Feet.	Inches,
39'371	3'281	1'094	3,280'899	1,093'633	0'621	1	
78'742	6'562	2'187	6,561'708	2,187'266	1'243	2	
118'112	9'843	3'281	9,842'607	3,280'899	1'864	3	
157'483	13'124	4'375	13,123'597	4,374'532	2'486	4	
196'854	16'404	5'468	16,404'496	5,468'165	3'107	5	
236'225	19'685	6'562	19,685'395	6,561'798	3'728	6	
275'596	22'966	7'655	22,966'294	7,655'431	4'350	7	
314'966	26'247	8'749	26,247'193	8,749'064	4'971	8	
354'337	29'528	9'843	29,528'092	9,842'697	5'592	9	
393'708	32'809	10'936	32,808'992	10,936'331	6'214	10	

## Metric.

Decimetres,	Metres.	Hectometres.	Kilometres.
0'25400	0'02540	0'00025	0'00003
3'04794	0'30479	0'00305	0'00030
9'14383	0'91438	0'00914	0'00091
18'28767	1'82877	0'01829	0'00183
50'29100	5'02911	0'05029	0'00503
2,011'64266	201'10437	2'01104	0'20116
16,093'1926	1,609'31493	16'09315	1'60931

111'303 kilometres. The length of 1' of latitude at  $45^{\circ}$  = 6,076 feet = 1'1508 Statute mile = 1852 metres, nearly.  
1 line =  $\frac{1}{10}$  inch = 2'1166 mm.

## PLIERS.

Decimetres.	Yards to Metres.	Kilometres.	Metres.	Hectometres.	Miles to Kilometres.
9'1438	0'914	0'0009	1,600'215	16'003	1'609
18'2877	1'829	0'0018	3,218'630	32'186	3'219
27'4315	2'743	0'0027	4,827'945	48'279	4'828
36'5753	3'658	0'0037	6,437'260	64'373	6'437
45'7192	4'572	0'0046	8,046'575	80'466	8'047
54'8630	5'486	0'0055	9,655'890	96'559	9'656
64'0068	6'401	0'0064	11,265'204	112'652	11'265
73'1507	7'315	0'0073	12,874'519	128'745	12'875
82'2945	8'229	0'0082	14,483'834	144'838	14'848
91'4383	9'144	0'0091	16,093'149	160'931	16'933

## Approximate Values.

1 kilometre . . . . .	= about 5 furlongs (0'029 less)	1 mile = nearly 1 $\frac{1}{2}$ kilometre (1 $\frac{1}{2}$ less).
1 metre . . . . .	= " 39 $\frac{1}{2}$ inches (0'029 less)	1 yard = " $\frac{1}{2}$ metre. 11 Metres = 12 yards.
To convert metres to yards add $\frac{1}{2}$ .		
1 Decimetre . . . . .	= 4 inches (3 $\frac{1}{2}$ exactly)	1 foot = " 30 $\frac{1}{2}$ centimetres.
1 Centimetre . . . . .	= $\frac{1}{2}$ inch	1 inch = " $\frac{2}{3}$ "
1 Millimetre . . . . .	= $\frac{1}{2}$ "	1 " = " 25 $\frac{1}{2}$ millimetres

## II.—Measures

## Metric to British Avoir

The standard unit of Metric Weight is the KILOGRAMME, which is the weight of a

	Grammes.	Grains.	Troy Ounces, (450 grains.)	Avoirdupois Ounces, (437 5 grains.)
Milligramme	1000	0'1543	0'0003	0'0003
Centigramme	100	0'1543	0'0032	0'0035
Decigramme	10	1'54323	0'00322	0'00353
GRAMME	1	15'43235	0'0315	0'0327
Decagramme	10	154'32349	0'32151	0'3247
Hectogramme	100	1,543'23487	3'21507	3'52739
KILOGRAMME	1,000	15,432'34874	32'15073	35'27394
Myriagramme	10,000	154,323'48740	321'50727	352'73940
Quintal		100 Kilogrammes	1'96841 Cwt.	0'0842 Tons
Millier or Tonne			19'68412 "	0'98421 "

## MULTI

	Milligrammes to Grains,	Centigrammes to Grains,	Decigrammes to Grains,	Grammes to Ap. Drachms.	Troy oz.	Avoir. oz.
1	0'0154	0'154	1'543	0'2572	0'032	0'035
2	0'0309	0'309	3'086	0'5144	0'064	0'071
3	0'0463	0'463	4'030	0'7716	0'096	0'106
4	0'0617	0'617	6'173	1'0288	0'129	0'141
5	0'0772	0'772	7'716	1'2860	0'161	0'176
6	0'0926	0'926	9'259	1'5432	0'193	0'212
7	0'1080	1'080	10'803	1'8004	0'225	0'247
8	0'1235	1'235	12'346	2'0576	0'257	0'282
9	0'1389	1'389	13'889	2'3149	0'289	0'318
10	0'1543	1'543	15'432	2'5721	0'322	0'353

## British Troy and

Grain	Milligrammes.	Centigrammes.	Decigrammes,
Scruple (A)	64'79895	6'47990	0'64799
Pennyweight (T)	129'57901	12'95797	1'295797
Drachm (A)	155'51748	15'55175	1'55175
Ounce	388'93702	38'89370	3'88937
Pound	3,110'34962	311'03496	31'103496
	373,241'95410	37,324'19541	3,7324'19545

In the new British Pharmacopœia the Avoirdupois Ounce and

## Avoirdupois

	Milligrammes.	Centigrammes.	Decigrammes.
Dram	27'34	2'734	0'2734
Ounce	437'5	43'75	0'4375
Pound	3,000'	300	0'300
Stone	14	1'4	0'14
Hundredweight	112	11'2	0'112
Ton	2,240	224	0'224

## MULTI

	Grains to Milligrms.	Centigrms. to Grms.	Decigrms. to Grms.	Apothecaries' Drachms to Grms.	Troy Ounces to Grms.	Hectogrms. to Kilogrms.
1	64'799	6'480	0'065	38'879	3'888	0'311
2	129'598	12'960	0'130	77'759	7'776	0'622
3	194'397	19'440	0'194	116'638	11'664	0'933
4	259'196	25'920	0'259	155'517	15'552	0'993
5	323'995	32'999	0'324	19'4397	1'944	1'244
6	388'794	38'879	0'389	23'276	2'328	1'866
7	453'593	45'359	0'454	27'2156	2'7216	2'177
8	518'392	51'839	0'518	31'035	3'103	2'488
9	583'190	58'319	0'583	34'9914	3'499	2'799
10	647'990	64'799	0'648	388'794	38'879	3'110

## Fractions of a Grain to Milligrammes.

1/16	32'4	1/16	12'96	1/16	9'26	7/16	45'36
1/8	21'6	1/8	25'92	1/8	8'10	5/8	58'32
3/16	45'2	3/16	38'88	3/16	7'20	5/16	3'24
5/16	16'2	5/16	51'84	5/16	6'48	3/16	1'30
7/16	48'6	7/16	10'80	7/16	19'44	1/16	0'65

## of Weight.

dupois and Troy.

cubic decimetre, or 61.027 cubic inches, of pure water, in vacuo, at 4° C. (39.2° F.).

Avoirdupois Pounds. (7000 grains.)	Hundredweights. (112 lbs. A.V.)	Avoirdupois. lbs. oz. grs.	Troy and Apothecaries. lbs. oz. dr. grs.
...	...	= 0 0 $\frac{3}{16}$ nearly.	0 0 0 $\frac{3}{16}$
0'00002	...	= 0 0 $\frac{3}{16}$	0 0 0 $\frac{3}{16}$
0'00022	...	= 0 0 $\frac{3}{16}$	0 0 0 $\frac{3}{16}$
0'00220	0'00002	= 0 0 $\frac{15}{16}$	0 0 0 2
0'02205	0'00020	= 0 0 $\frac{15}{16}$	0 3 1 43
0'22046	0'00197	= 0 3 $\frac{23}{16}$	2 8 1 12
2'20462	0'01968	= 2 3 $\frac{119}{16}$	26 9 4 32
22'04621	0'19684	= 22 0 $\frac{323}{16}$	

= weight of 1 cubic metre of water.

### PLIERS.

Hectogrammes to			Kilogrammes to			Quintals to			Milliers to Tons.		
Troy oz.	Avoir, oz.	Avoir, lbs.	Troy oz.	Avoir, oz.	Avoir, lbs.	Troy oz.	Avoir, lbs.	Hundredweights.	Troy oz.	Avoir, lbs.	Milliers
3'215	3'527	0'220	32'151	35'274	2'205	1'968	1'968	0'084	1'968	1'968	0'084
6'430	7'055	0'441	64'301	70'548	4'409	3'937	3'937	0'044	3'937	3'937	0'044
9'645	10'582	0'661	96'452	105'822	6'614	5'905	5'905	0'066	5'905	5'905	0'066
12'860	14'110	0'882	128'603	141'096	8'818	7'874	7'874	0'088	7'874	7'874	0'088
16'075	17'637	1'102	160'754	176'370	11'023	9'842	9'842	0'102	9'842	9'842	0'102
19'290	21'164	1'323	192'904	211'644	13'228	11'810	11'810	0'132	11'810	11'810	0'132
22'506	24'692	1'543	225'055	246'918	15'432	13'779	13'779	0'154	13'779	13'779	0'154
25'721	28'219	1'764	257'206	282'192	17'637	15'747	15'747	0'176	15'747	15'747	0'176
28'936	31'747	1'984	289'357	317'465	19'842	17'716	17'716	0'198	17'716	17'716	0'198
32'151	35'274	2'205	321'507	352'739	22'046	19'684	19'684	0'220	19'684	19'684	0'220

### Apothecaries Weight to Metric.

Grammes.	Decagrammes.	Hectogrammes.	Kilogrammes.
0'000480	0'00048	0'00065	0'00006
1'29508	0'12960	0'01296	0'00130
1'55517	0'15552	0'01555	0'00156
3'88794	0'38879	0'03888	0'00389
31'10350	3'11035	0'31103	0'03110
373'24195	37'32420	3'73242	0'37324

Pound and the ordinary Grain are the only weights adopted.

### to Metric.

Grammes.	Decagrammes.	Hectogrammes.	Kilogrammes.
1'71185	0'17718	0'01772	0'00177
28'34954	2'83495	0'28350	0'02835
453'59265	45'35927	4'53593	0'45359
6,350'29714	635'02971	63'50297	0'635030
50,802'37709	5,080'23771	508'02377	0'5080238
1,016,047'54170	101,604'75417	1,016,047'542	1,016'047542

### PLIERS.

Avoirdupois Ounces to	Hectograms.	Kilograms.	Avoirdupois Pounds to	Hectograms.	Kilograms.	Hundredweights to	Quintals.	Tons to Milliers.
28'350	0'283	0'028	453'593	4'536	0'454	0'508	1'016	1'016
56'699	0'507	0'057	907'185	9'072	0'907	1'016	2'032	2'032
85'049	0'850	0'085	1360'778	13'608	1'361	1'524	3'048	3'048
113'398	1'134	0'113	1814'571	18'144	1'814	2'032	4'064	4'064
141'748	1'417	0'142	2267'963	22'680	2'268	2'540	5'080	5'080
170'097	1'701	0'170	2721'556	27'216	2'722	3'048	6'096	6'096
198'447	1'084	0'198	3175'149	31'751	3'175	3'556	7'112	7'112
226'796	2'268	0'227	3628'741	36'287	3'629	4'064	8'128	8'128
255'146	2'551	0'255	4082'334	40'823	4'082	4'572	9'144	9'144
283'495	2'835	0'283	4535'927	45'359	4'536	5'080	10'160	10'160

### Approximate Equivalents.

1,000 Kilogrammes or Metric Tonne is nearly 1 English Ton (about 1 $\frac{1}{2}$ % less).

1 Kilogramme equals weight of cubic decimetre or litre of water.

1 Kilogramme is nearly 2 $\frac{1}{2}$  lb. Avoirdupois (about 1% more); 5 Kilos. = 11 lb. nearly.

1 Hectogramme is about 3 $\frac{1}{2}$  ounces Avoirdupois.

1 Decagramme is about  $\frac{1}{2}$  ounce.

1 Gramme is about 1 $\frac{1}{2}$  grains.

65 Milligrammes are about 1 grain.

1 Hundredweight is nearly 51 Kilos. (about 1 $\frac{1}{2}$ % less).

10 $\frac{1}{2}$  Troy = 31 $\frac{1}{2}$  grammes

1 ounce Avoirdupois = 28 $\frac{1}{2}$  grammes } photographic formulæ.

1 Drachm = 4 grammes nearly (about 1 $\frac{1}{2}$  grains less).

## III.—Measures of

## Metric

The Unit of Metric Measures of Capacity is the LITRE, or Cubic Decimetre, equal to the

	Litres.	Cubic Inches.	Cubic Feet.	Fluid, Oz.
Millilitre or cubic centimetre	= $\frac{1}{1000}$	0.06103	0.00004	0.03522
Centilitre = 10 cubic cents	= $\frac{1}{10}$	0.61027	0.00035	0.35215
Decilitre = 100	= $\frac{1}{100}$	6.10271	0.00353	3.52155
Litre or cubic Decimetre	= 1	61.02705	0.03532	35.21517
Decalitre	= 10	610.27052	0.35317	352.15468
Hectolitre	= 100	6,102.70515	3.53166	3,521.54683
Kilotitre (cubic metre)	= 1,000	61,027.05152	35.2151658	35,215.46823
Myrialitre	= 10,000	610,270.51519	353.16581	352,154.68280

N.B.—The above Table is based upon the value of the Litre as given in the Weights and Measures Act of 1878 = 0.2202443 Imperial gallons. Under this valuation the Litre = 35.23909 fluidounces

## MULTI

	Millilitres			Centilitres		
Minims.	Fl. Drachms.	Fl. Oz.		Fl. Drachms.	Fl. Ounces.	Pints.
1	16.903	0.283	0.035	2.817	0.352	3.522
2	33.807	0.563	0.070	5.634	0.704	7.043
3	50.710	0.845	0.106	8.452	1.056	10.505
4	67.614	1.127	0.141	11.269	1.409	14.086
5	84.517	1.409	0.176	14.086	1.761	17.608
6	101.421	1.690	0.211	16.003	2.113	21.129
7	118.324	1.972	0.247	19.721	2.405	24.651
8	135.227	2.254	0.282	22.538	2.817	28.172
9	152.131	2.536	0.317	25.355	3.169	31.694
10	169.034	2.817	0.352	28.172	3.522	35.215

## British

	Millilitres or cubic centimetres,	Centilitres,
Minim	= 0.05916	0.00592
Drachm	= 3.54958	0.35496
Fluid ounce	= 28.39661	2.83966
Pint	= 567.93245	56.79324
Quart	= 1,135.80449	113.58065
Gallon	= 4,543.45797	454.34580

According to the corrected value of the Litre, as above, 1 pint = 567.55

## MULTI

	Minims		Fl. Drachms		Fluid Ounces		
	to	Millilitres.	to	Millilitres.	to	Decilitres.	Litres.
1	= 0.059	15 = 0.887	1	= 3.550	28.397	0.284	0.028
2	= 0.118	20 = 1.183	2	= 7.099	56.793	0.568	0.057
3	= 0.177	25 = 1.479	3	= 10.649	85.190	0.852	0.085
4	= 0.237	30 = 1.775	4	= 14.198	113.586	1.136	0.114
5	= 0.296	35 = 2.071	5	= 17.748	141.983	1.420	0.142
6	= 0.355	40 = 2.366	6	= 21.297	170.380	1.704	0.170
7	= 0.414	45 = 2.663	7	= 24.847	198.776	1.988	0.199
8	= 0.473	50 = 2.958	8	= 28.397	227.173	2.272	0.227
9	= 0.532	55 = 3.254	9	= 31.946	255.570	2.556	0.256
10	= 0.592	60 = 3.550	10	= 35.496	283.966	2.840	0.284

## Useful Data.

1 Minim is the measure of 0.91146 grains of water.

1 Fluid drachm = 54.6875

1 Fluid ounce = 437.5

1 Pint = 1.25 lb or 8750

1 Gallon = 10 lb or 70,000

Cubic feet  $\times$  6.2321 = gallons.

Gallons  $\times$  160.6 = cubic feet.

Litres  $\times$  0.3532 =

Cubic inch of distilled water at 62° F., Bar. 30 ins. = 252.458 grains = 0.0361 lb = 16.386176 cubic cent.

Cubic foot of water = 6.2321 lb = 6.2321 gallons = 28.15312 litres.

Ton of water = 35.2 cubic feet.

## Capacity (Fluid).

to British.

weight of 1,000 grammes of pure water, at a temperature of 4° C. (39.2° F.).

Pints.	Gallons.	Pints.	Fl. Oz.	Fl. Drachms.	Minims.
3465923 Cub. Ins.	277.27384 Cub. Ins.				
= 0.00176	0.00022	= 0	0	0	16.0034
= 0.01761	0.00220	= 0	0	2	49.03
= 0.17608	0.0201	= 0	0	4	10.34
= 1.76077	0.2010	= 0	1	15	1.34
= 17.60773	2.0097	= 2	1	12	43.43
= 176.07734	22.0067	= 22	0	4	13.4
= 1,760.77341	220.09668	= 220	0	3	22.47
= 17,607.73414	2,200.09667	= 2,200	7	5	44.50

1.76077 pints or 0.22009668 gallon. More accurate determination shows that the correct equivalent is 1.761954 pints, or the Millilitre = 28.913 fluid drachms = 16.91476 minims. The practical difference is trifling.

## PLIERS.

Fl. Ounces.	Litres to Pints.	Gallons.	Decalitres to Quarts.		Kilolitres to Gallons.
			Quarts.	Gallons.	
35.215	1.761	0.220	8.804	2.201	220.097
70.431	3.522	0.440	17.608	4.402	440.193
105.646	5.282	0.660	26.412	6.603	660.200
140.862	7.043	0.880	35.215	8.804	880.387
176.077	8.804	1.100	44.019	11.005	1,100.483
211.293	10.565	1.321	52.823	13.206	1,320.580
246.508	12.325	1.541	61.627	15.407	1,540.677
281.724	14.086	1.761	70.431	17.608	1,760.773
316.939	15.847	1.981	79.235	19.809	1,980.870
352.155	17.608	2.201	88.039	22.010	2,200.967

## to Metric.

Decilitres.	Litres.	Decalitres.	Kilolitres.
0.00059	0.00006	0.00001	...
0.03550	0.00355	0.00035	...
0.28397	0.02840	0.00284	0.000028
5.67932	0.56793	0.05679	0.000568
11.35864	1.13586	0.11359	0.001136
45.43458	4.54346	0.45435	0.004543

Litre. 1 fluid ounce = 28.377 C. C. 1 fluid drachm = 3.547 C. C. 1 minim = 0.5911 C. C.

## PLIERS.

Millilitres.	Pints to Decilitres.	Litres.	Quarts to Litres.	Gallons to Litres.
567.932	5.679	0.568	1.136	4.543
1,135.864	11.359	1.136	2.272	9.087
1,703.797	17.038	1.704	3.408	13.930
2,271.729	22.717	2.272	4.543	18.174
2,839.661	28.397	2.840	5.679	22.717
3,407.593	34.076	3.408	6.815	27.261
3,975.546	39.755	3.976	7.951	31.804
4,543.488	45.435	4.543	9.087	36.348
5,111.390	51.114	5.111	10.223	40.891
5,679.322	56.793	5.679	11.359	45.435

## Approximate values.

1 Millilitre or cubic centimetre is 17 minims nearly.

1 Centilitre is about 2 drachms 49 minims.

1 Decilitre is about 3½ ounces.

1 Litre is about 35½ fluid ounces, or rather more than 1½ pint.

1 Kilolitre or cubic metre holds nearly one ton of water 62° F.

1 Fluid drachm is rather more than 3½ cubic centimetres (1½% more).

1 Fluid ounce is about 28½ cubic centimetres.

1 Quart is rather more than 1½ litres.

1 Gallon is about 4½ litres (1% more).

## IV.--Cubic

*The unit of Metric Measurement is the STERE, or CUBIC METRE, weighing Metric to*

	Cubic Metre.
Cubic Millimetre	= 0.000001
Cubic Centimetre	= 0.001
Millistere (cubic decim.)	= 0.001
Centistere	= 0.01
Decistere	= 0.1
STERE (cubic metre)	= 1
Decastere	= 10
Hectostere	= 100

NOTE.—The Stere is more generally used for measuring timber, wood-work, or firewood.

	MULTI
Cubic Centimetres to Cubic Inches,	Cubic Decimetres to
1 0.051	61.027
2 0.122	122.054
3 0.183	183.081
4 0.244	244.108
5 0.305	305.135
6 0.366	366.162
7 0.427	427.189
8 0.488	488.216
9 0.549	549.243
10 0.610	610.271

	British to
Cubic Inches.	Cubic Feet.
= 1	= 0.0005787
Cubic foot	= 1.00
Cubic yard	= 27.00

	MULTI
Cubic Inches to Cubic Centimetres.	Cubic Feet to
1 16.386	28.315
2 32.772	56.631
3 49.159	84.946
4 65.545	113.261
5 81.931	141.577
6 98.317	169.892
7 114.703	198.207
8 131.089	226.522
9 147.476	254.838
10 163.862	283.153

Approximate

1 cubic metre is nearly 1 $\frac{1}{3}$  cubic yard (1 $\frac{2}{3}$  % less).

1 " " is nearly 35 $\frac{1}{3}$  cubic feet (0 $\frac{5}{3}$  % less).

10 cubic metres equal 13 cubic yards.

1 cubic yard is about  $\frac{3}{4}$  cubic metre (2 % more).

1 cubic foot is about 28 $\frac{1}{3}$  cubic decimetres (0.18 less).

NOTE.—To reduce cubic metres to cubic decimetres or cubic centimetres, which are all multiples of 1,000, the decimal to convert cubic metres into cubic decametres or cubic hectometres the decimal point is removed 3 places at a time to the

## Measures.

1 Millier, or 1,000 Kilogrammes, of pure water, at 4° C. (39° 2° F.).

British.

Cubic Inches.	Cubic Feet.	Cubic Yards.
0'000061	0'000003	.....
0'061027	0'000353	0'000001
61'027052	0'035317	0'001308
610'270515	0'353166	0'013080
6102'705152	3'531658	0'130802
61027'051519	35'316581	1'308022
610270'515194	353'165807	13'080215
.....	3531'658074	130'802151

The Centistere, Decistere, Decastere, and Hectostere are not cubic measures but only measures of volume.

PLIERS.

Cubic Feet.	Cubic Metres to	Cubic Yards.
35'317	.....	1'308
70'633	.....	2'616
105'950	.....	3'924
141'266	.....	5'232
176'583	.....	6'540
211'899	.....	7'848
247'216	.....	9'156
282'533	.....	10'464
317'849	.....	11'772
353'166	.....	13'080

Metric.

Cubic Centimetres.	Cubic Decimetres.
= 16'386176	0'016386
= 28315'311931	28'315312
= 764513'422137	764'513422

PLIERS.

Cubic Decimetres.	Cubic Yards to	Cubic Metres.
764'513	.....	0'765
1529'027	.....	1'529
2293'540	.....	2'294
3058'054	.....	3'058
3822'567	.....	3'823
4587'080	.....	4'587
5351'594	.....	5'352
6116'107	.....	6'116
6880'621	.....	6'881
7645'134	.....	7'645

Values.

- 1 cubic inch is about 16 $\frac{2}{3}$  cubic centimetres ('014 less).
- 1 cubic metre is the cube of nearly 39 $\frac{2}{3}$  inches (135'9 cubic inches less).
- 1 cubic decimetre is the cube of nearly 4 inches (3 cubic inches less).
- 1 cubic centimetre is the cube of nearly  $\frac{1}{10}$  inch ('00297 cubic inches less).
- 1 cubic millimetre is the cube of nearly  $\frac{1}{1000}$  inch ('00003 cubic inches less).

point must be removed 3 places at a time to the right, instead of one, as the denomination would seem to imply. Similarly left.

## V.—Square

## Metric to

## The Unit of Metric Measurement for Land Measure

	Sq. Millimetre	Sq. Metre.	Sq. centim.	Sq. Inches.	Sq. Feet.
Square Centimetre	$\frac{1}{10000}$	$\frac{1}{100}$	$\frac{1}{100}$	0'00155	0'0001
Square Decimetre	$\frac{1}{100}$	$\frac{1}{100}$	$\frac{1}{100}$	0'15501	0'00108
Square Metre, or Centiare	1	1	1	15'5059	0'10764
ARE	100	100	100	1,550'05911	10'76430
Hectare	10,000	10,000	10,000	155,005'91052	1,076'42993
				...	107,642'99341

## MULTI

	Square Millims.	Square Centimetres	Square Decimetre	
	to	to	to	
1	Sq. Inches.	Sq. Inches.	Sq. Feet.	Sq. Yards.
2	0'002	0'155	0'001	0'012
3	0'003	0'310	0'002	0'024
4	0'005	0'465	0'003	0'036
5	0'006	0'620	0'004	0'048
6	0'008	0'775	0'005	0'060
7	0'009	0'930	0'006	0'072
8	0'011	1'085	0'008	0'084
9	0'012	1'240	0'009	0'096
10	0'014	1'395	0'010	0'108
	0'016	1'550	0'011	0'120

## British

	Square Millimetres.	Square Centimetres.
Square Inch	=	645'13669
Foot	= 144 square inches.	6'45137
Yard	= 9 " feet.	928'99683
Perch	= 30'25 " yards.	8,360'97150
Rood	= 40 " perches.	...
Acre	= 4 roods.	...
Square Mile	= 640 acres.	...

## MULTI

	Square Inches	Square Feet	Square Yards	
	to	to	to	
1	Sq. Millims. Sq. Centims.	Sq. Centims. Sq. Decims. Sq. Metres.	Sq. Decims. Sq. Metres.	Sq. Yards.
2	645'137 6'451	928'997 9'2900	0'093	83'610 0'8361
3	1290'273 12'903	1,857'994 18'5799	0'186	167'219 1'6722
4	1935'410 19'354	2,786'990 27'8699	0'279	250'829 2'5083
5	2580'547 25'805	3,715'987 37'1599	0'372	334'439 3'3444
6	3225'683 32'257	4,644'984 46'4498	0'464	418'049 4'1805
7	3870'820 38'708	5,573'981 55'7398	0'557	501'658 5'0166
8	4515'957 45'160	6,502'978 65'0298	0'650	585'268 5'8527
9	5161'094 51'611	7,431'975 74'3197	0'743	668'878 6'6888
10	5806'230 58'062	8,360'071 83'6097	0'836	752'487 7'5249
	6451'367 64'514	9,289'968 92'8997	0'929	8360'097 8360'097

## Approximate

One square millimetre is nearly  $\frac{1}{645}$  of a square inch, or the square of  $\frac{1}{645}$  of an inch.

One square centimetre is nearly  $\frac{1}{645}$  of a square inch, or the square of  $\frac{1}{645}$  of an inch.

One square metre contains rather more than 10 $\frac{1}{2}$  square feet, or nearly 1 $\frac{1}{2}$  square yards.

One acre is about  $\frac{1}{40}$  of an acre.

One hectare contains nearly 2 $\frac{1}{2}$  acres.

## Measure.

British.

is the ARE = 100 square Metres or a square Decametre.

Sq. Yards.	Sq. Perches.	Roods.	Acres.
...	...	...	...
0'00012	...	...	...
0'01196	0'00040	0'00001	...
1'19603	0'03954	0'00099	0'00025
119'60333	3'95383	0'0985	0'02471
11,960'33260	395'38290	9'88457	2'47114

PLIERS.

Sq. Metres		Ares			Hectares		
to	to	to	to	to	to	to	to
Sq. Feet.	Sq. Yds.	Sq. Yds.	Perches.	Roods.	Acres.	Roods.	Acres.
10'764	1'196	119'603	3'954	0'099	0'025	9'885	2'471
21'529	2'392	239'207	7'908	0'198	0'049	19'769	4'942
32'293	3'588	358'810	11'861	0'297	0'074	29'654	7'413
43'057	4'784	478'413	15'815	0'395	0'099	39'538	9'885
53'821	5'980	598'017	19'769	0'494	0'124	49'423	12'356
64'586	7'176	717'620	23'723	0'593	0'148	59'307	14'827
75'350	8'372	837'223	27'677	0'692	0'173	69'192	17'298
86'114	9'568	956'827	31'631	0'791	0'198	79'077	19'769
96'879	10'764	1,076'430	35'584	0'890	0'222	88'961	22'240
107'643	11'960	1,196'033	39'538	0'988	0'247	98'846	24'711

to Metric.

Sq. Decimetres,	Sq. Metres,	Ares,	Ares,	Ares.	Hectares,
0'06451	0'00065	0'00001	0'00001	0'00001	...
9'28997	0'09290	0'00093	0'00093	0'00093	0'00001
83'60971	0'83610	0'00836	0'00836	0'00836	0'00008
2,529'19388	25'29194	0'25292	0'25292	0'25292	0'00253
...	1,011'67755	10'11678	10'11678	10'11678	0'10117
...	4,046'71021	40'46710	40'46710	40'46710	0'40467
...	...	25,898'94531	25,898'94531	25,898'94531	258'98945

PLIERS.

Sq. Metres,	Ares,	Rood	Acres	Acres	Square Miles
to	to	to	to	to	to
25'292	0'253	10'117	40'467	0'405	258'989
50'584	0'506	20'234	80'934	0'809	517'979
75'876	0'759	30'350	121'401	1'214	776'968
101'168	1'012	40'467	161'868	1'619	1,035'958
126'460	1'265	50'584	202'336	2'023	1,294'947
151'752	1'518	60'701	142'803	2'428	1,553'037
177'044	1'770	70'817	283'270	2'833	1,812'926
202'336	2'023	80'934	323'737	3'237	2,071'916
227'627	2'276	91'051	364'204	3'642	2,330'905
252'919	2'529	101'168	404'671	4'047	2,589'895

Values.

One square inch contains about 645 square millimetres or  $6\frac{1}{2}$  square centimetres.

One square foot contains nearly  $9\frac{1}{4}$  square decimetres or  $\frac{1}{11}$  of a square metre.

One square yard is nearly  $\frac{9}{16}$  or  $\frac{2}{3}\frac{1}{3}$  of a square metre.

1 Acre is nearly  $40\frac{1}{2}$  ares or  $\frac{9}{2}$  of a hectare.

1 Square mile is very nearly 259 hectares.

## VI.—Conversion of British

## British Indian

## The unit of British Indian Weight

			Milligrammes.	Centigrammes.
Dhan	=	$\frac{1}{384}$ Tola	= $\frac{1}{32}$ Grain	= 30'37451
Rati	=	$\frac{1}{64}$ "	= $\frac{1}{8}$ Grains	= 121'49803
Masha	=	$\frac{1}{12}$ "	= 15 "	= 971'08426
TOLA	=	1 Tolas	= 180 "	= 1163'81107
Chhatak	=	5 Tolas	= 900 "	= 58319'05533
Ser (Seer)	=	80 "	= 2 lbs 400 Grains avoir.	= 933104'88524
Man (Maund)	=	3,200 "	= 82 $\frac{1}{2}$ lbs Avoir. 100lbs. Troy=	= 933104'88524
				3732419'54095

Under Bengal Regulation VII of 1833, the only legalised British Indian weights are the Tola, of 180 grains Troy; the and their values vary considerably in different parts of India; those stated in the table are given by Prinsep (*Useful Tables*,

Dhans		Ratis		Mashas		Tolas		MULTI	
to	to	to	to	to	to	to	to	Milligrammes.	Milligrammes.
1	= 30'375	121'498	971'984	0'972	11'664	1'166	0'012		
2	= 60'749	242'996	1943'969	1'944	23'328	2'333	0'023		
3	= 91'124	364'494	2915'953	2'916	34'991	3'499	0'035		
4	= 121'498	485'992	3887'937	3'888	46'655	4'666	0'047		
5	= 151'873	607'490	4859'921	4'860	58'319	5'832	0'058		
6	= 182'247	728'988	5831'906	5'832	69'983	6'998	0'070		
7	= 212'622	850'86	6803'800	6'804	81'647	8'165	0'082		
8	= 242'996	971'884	7775'874	7'776	93'310	9'331	0'093		
9	= 273'371	1093'882	8747'858	8'748	104'974	10'497	0'105		
10	= 303'745	1214'980	9719'843	9'720	116'638	11'664	0'117		

Metric to	
	Mashas.
Milligramme	= 0'03292
Centigramme	= 0'3292
Decigramme	= 3'29223
Gramme	= 32'92234
Decagramme	= 329'22344
Hectogramme	= 3292'23140
Kilogramme	= 32922'34398
Myriagramme	= .....
Quintal	= .....
Millier or Tonne	= .....

Dhans.		Ratis.		Mashas.		Tolas.		MULTI	
	to		to		to		to		
1	32'022	8'231	1'029	0'086	0'017	0'0011			
2	65'845	16'461	2'058	0'171	0'034	0'0021			
3	98'767	24'692	3'086	0'257	0'051	0'0032			
4	131'689	32'922	4'115	0'343	0'059	0'0043			
5	164'612	41'153	5'144	0'429	0'086	0'0054			
6	197'534	49'384	6'173	0'514	0'103	0'0064			
7	230'456	57'614	7'202	0'600	0'120	0'0075			
8	263'379	65'845	8'231	0'686	0'137	0'0086			
9	296'301	74'075	9'259	0'772	0'154	0'0096			
10	329'223	82'306	10'288	0'857	0'171	0'0107			

## Approximate Equivalents.

1 Rati is nearly  $1\frac{1}{2}$  decigrammes (about '035 less).

1 Masha is nearly 1 gramme (about '028 less).

1 Tola is nearly  $1\frac{1}{2}$  grammes (about '003 less).

1 Ser is nearly 1 kilogramme (about '067 less).

1 Man is nearly 3 $\frac{1}{2}$  myriagrammes (about '018 less).

1 " " " is nearly 3 $\frac{1}{2}$  kilogrammes (about '009 less).

1 Decigramme is nearly  $\frac{1}{12}$  of a tola, or 3 $\frac{1}{2}$  dhans (about '04 less).

1 Gramme is nearly 1 masha or  $\frac{1}{12}$  of a tola (about '029 more).

1 Decagramme is about  $\frac{1}{12}$  of a tola (about '007 more).

1 Hectogramme is about 8 $\frac{1}{2}$  tolas (about '074 more) or nearly  $1\frac{1}{2}$  chhataks (about '035 less).

1 Kilogramme is nearly 8 $\frac{1}{2}$  tolas (about '015 less) or about 1 ser (about '072 more).

1 Quintal is about 2 $\frac{1}{2}$  mans (about '0125 more).

1 Millier or Tonne is nearly 26 $\frac{1}{2}$  mans (about '008 less).

## Indian and Metric Weights.

to Metric.

is the TOLA, equal to 180 Grains.

Decigrammes.	Grammes.	Decagrammes.	Hectogrammes.	Kilogrammes.	Myriagrammes.
0.30375	0.03037	0.00304	0.00030	0.00003	....
1.21408	0.12150	0.01215	0.00121	0.00012	0.00001
9.71984	0.97108	0.09720	0.00972	0.00097	0.00010
116.63811	11.66381	1.16638	0.11664	0.01166	0.00117
583.10055	58.31005	5.83101	0.58319	0.05832	0.00583
9331.04885	933.10489	93.31049	9.33105	0.93310	0.09331
37341.95410	3734.19541	373.241954	37.324195	3.732420	0.373242

Ser equal to 80 Tolas and the Man equal to 40 Sers. Mashas, Ratis and Dhans are used by native goldsmiths and jewellers, p. 96. There is also a weight called Panseri equal to 5 sers.

PLIERS.

Chhataks	Sers			Mans	
to	to	to	to	to	
Grammes.	Kilogrammes.	Grammes.	Kilogrammes.	Grammes.	Kilogrammes.
58.319	0.058	933.105	0.933	37.324	1
116.638	0.117	1866.210	1.866	74.648	2
174.957	0.175	2799.315	2.799	111.973	3
233.276	0.233	3732.420	3.732	149.297	4
291.595	0.292	4665.524	4.666	186.621	5
349.914	0.350	5598.629	5.599	223.945	6
408.233	0.408	6531.734	6.532	261.269	7
466.552	0.467	7464.839	7.465	298.594	8
524.871	0.525	8397.944	8.398	335.918	9
583.191	0.583	9331.049	9.331	373.242	10

## British Indian.

Tolas.	Chhataks.	Sers.	Mans.
0.00009	0.00002	....	....
0.00086	0.00017	0.00001	....
0.00857	0.00171	0.00011	....
0.08574	0.01715	0.00107	0.00003
0.85735	0.17147	0.01073	0.00027
8.57353	1.71471	0.10717	0.00208
85.73527	17.14705	1.07169	0.02679
857.35271	171.47054	10.71691	0.26792
8573.52708	1714.70542	107.16909	2.67923
85735.27078	17147.05416	1071.69088	26.79227

PLIERS.

Tolas.	Chhataks.	Sers.	Mans.	Quintals
Kilogrammes	to	to	to	to
85.735	17.147	1.0717	0.0268	2.6792
171.471	34.294	2.1434	0.0536	5.3585
237.206	51.441	3.2151	0.0804	8.0377
342.041	68.588	4.2868	0.1072	10.7169
428.676	85.735	5.3585	0.1340	13.3961
514.412	102.882	6.4301	0.1608	16.0753
600.147	120.029	7.5018	0.1875	18.7546
685.882	137.176	8.5735	0.2143	21.4338
771.617	154.323	9.6452	0.2411	24.1130
857.353	171.471	10.7169	0.2679	26.7923

## Fractions of a Tola to Milligrammes.

$\frac{1}{16}$	= 728.988	$\frac{1}{160}$	= 4373.029
$\frac{1}{8}$	= 1457.976	$\frac{1}{80}$	= 5831.906
$\frac{1}{4}$	= 2915.953	$\frac{1}{40}$	= 7775.874
$\frac{1}{3}$	= 3887.937	$\frac{1}{30}$	= 8747.858

## Useful Data.

1 Man is equal to 100 lb Troy.

35 Sers are equal to 72 lb Avoirdupois.

1 Pound Troy is equal to 32 Tolas.

1 Ounce Troy is equal to 2.67 Tolas.

1/3 Ounce Avoirdupois (the unit for English letter postage) = 1.215 Tolas.

15 Grammes (the unit for foreign letter postage) = 1.285 Tolas or about 1 $\frac{1}{4}$  Tolas.

## VII.—Table of Sizes of Lithographic and Drawing

DESCRIPTION.	Broadside.	Long folio.	Long thirds.	Long fourths.	Broad folio.	Broad thirds.
LITHOGRAPHIC						
Special . . . .	59 × 38½	59 × 19½	59 × 12½	59 × 9½	38½ × 29½	38½ × 19½
Antiquarian . . . .	53½ × 31½	53½ × 15½	53½ × 10½	53½ × 7½	31½ × 26½	31½ × 17½
Double Imperial . . . .	44½ × 30½	44½ × 15½	44½ × 10½	44½ × 7½	30½ × 22½	30½ × 14½
Thick Special . . . .	40 × 40	40 × 20	40 × 13½	40 × 10	40 × 20	40 × 13½
Double Elephant . . . .	40 × 27	40 × 13½	40 × 9	40 × 6½	27 × 20	27 × 13½
Double Royal . . . .	40 × 25	40 × 12½	40 × 8½	40 × 6½	25 × 20	25 × 13½
Atlas . . . .	34 × 26½	34 × 13½	34 × 8½	34 × 6½	26½ × 17	26½ × 11½
Imperial . . . .	30 × 22	30 × 11	30 × 7½	30 × 5½	22 × 15	22 × 10
Super Royal . . . .	27 × 19½	27 × 9½	27 × 6½	27 × 4½	19½ × 13½	19½ × 9

## WHATMAN'S HAND-MADE

Antiquarian . . . .	53½ × 30½	53½ × 15½	53½ × 10½	53½ × 7½	30½ × 26½	30½ × 17½
Double Elephant . . . .	40½ × 27	40½ × 13½	40½ × 9	40½ × 6½	27 × 20½	27 × 13½
Atlas . . . .	33½ × 26	33½ × 13	33½ × 8½	33½ × 6½	26 × 16½	26 × 11½
Imperial . . . .	30½ × 22	30½ × 11	30½ × 7½	30½ × 5½	22 × 15½	22 × 10½
Super Royal . . . .	27 × 19½	27 × 9½	27 × 6½	27 × 4½	19½ × 13½	19½ × 9
Royal . . . .	24 × 19½	24 × 9½	24 × 6½	24 × 4½	19½ × 12	19½ × 8
Medium . . . .	22 × 17½	22 × 8½	22 × 5½	22 × 4½	17½ × 11	17½ × 7½
Demy . . . .	20 × 15½	20 × 7½	20 × 5½	20 × 3½	15½ × 10	15½ × 6½

## Papers and their Principal Subdivisions.

Long quarto.	Broad quarto.	Long octavo.	Common octavo.	Long 12mo.	Common 12mo.	16mo.	32mo.
--------------	---------------	--------------	----------------	------------	--------------	-------	-------

### PAPERS.

$38\frac{1}{4} \times 14\frac{3}{4}$	$29\frac{1}{2} \times 19\frac{1}{8}$	$29\frac{1}{2} \times 9\frac{9}{16}$	$19\frac{1}{8} \times 14\frac{3}{4}$	$19\frac{1}{8} \times 9\frac{5}{6}$	$19\frac{2}{3} \times 9\frac{9}{16}$	$14\frac{3}{4} \times 9\frac{9}{16}$	$9\frac{9}{16} \times 7\frac{3}{8}$
$31\frac{1}{4} \times 13\frac{3}{8}$	$26\frac{3}{4} \times 15\frac{5}{8}$	$26\frac{3}{4} \times 7\frac{13}{16}$	$15\frac{5}{8} \times 13\frac{3}{8}$	$15\frac{5}{8} \times 8\frac{11}{12}$	$17\frac{5}{8} \times 7\frac{13}{16}$	$13\frac{3}{8} \times 7\frac{13}{16}$	$7\frac{13}{16} \times 6\frac{11}{16}$
$30\frac{1}{4} \times 11\frac{1}{16}$	$22\frac{1}{8} \times 15\frac{1}{8}$	$22\frac{1}{8} \times 7\frac{9}{16}$	$15\frac{1}{8} \times 11\frac{1}{16}$	$15\frac{1}{8} \times 7\frac{3}{8}$	$14\frac{3}{4} \times 7\frac{9}{16}$	$11\frac{1}{16} \times 7\frac{9}{16}$	$7\frac{9}{16} \times 5\frac{7}{16}$
$40 \times 10$	$20 \times 20$	$20 \times 10$	$20 \times 10$	$20 \times 6\frac{1}{3}$	$13\frac{1}{3} \times 10$	$10 \times 10$	$10 \times 5$
$27 \times 10$	$20 \times 13\frac{1}{2}$	$20 \times 6\frac{3}{4}$	$13\frac{1}{2} \times 10$	$13\frac{1}{2} \times 6\frac{2}{3}$	$13\frac{1}{3} \times 6\frac{3}{4}$	$10 \times 6\frac{3}{4}$	$6\frac{3}{4} \times 5$
$25 \times 10$	$20 \times 12\frac{1}{2}$	$20 \times 6\frac{1}{4}$	$12\frac{1}{2} \times 10$	$12\frac{1}{2} \times 6\frac{2}{3}$	$13\frac{1}{3} \times 6\frac{1}{4}$	$10 \times 6\frac{1}{4}$	$6\frac{1}{4} \times 5$
$26\frac{1}{2} \times 8\frac{1}{2}$	$17 \times 13\frac{1}{4}$	$17 \times 6\frac{5}{8}$	$13\frac{1}{4} \times 8\frac{1}{2}$	$13\frac{1}{4} \times 5\frac{2}{3}$	$11\frac{1}{3} \times 6\frac{5}{8}$	$8\frac{1}{2} \times 6\frac{5}{8}$	$6\frac{5}{8} \times 4\frac{1}{4}$
$22 \times 7\frac{1}{2}$	$15 \times 11$	$15 \times 5\frac{1}{2}$	$11 \times 7\frac{1}{2}$	$11 \times 5$	$10 \times 5\frac{1}{2}$	$7\frac{1}{2} \times 5\frac{1}{2}$	$5\frac{1}{2} \times 3\frac{3}{4}$
$19\frac{1}{2} \times 6\frac{3}{4}$	$13\frac{1}{2} \times 9\frac{3}{4}$	$13\frac{1}{2} \times 4\frac{7}{8}$	$9\frac{3}{4} \times 6\frac{3}{4}$	$9\frac{3}{4} \times 4\frac{1}{2}$	$9 \times 4\frac{7}{8}$	$6\frac{3}{4} \times 4\frac{7}{8}$	$4\frac{7}{8} \times 3\frac{5}{8}$

### DRAWING PAPERS.

$30\frac{1}{2} \times 13\frac{5}{16}$	$26\frac{5}{8} \times 15\frac{1}{4}$	$26\frac{5}{8} \times 7\frac{5}{8}$	$15\frac{1}{4} \times 13\frac{5}{16}$	$15\frac{1}{4} \times 8\frac{7}{8}$	$17\frac{3}{4} \times 7\frac{5}{8}$	$13\frac{5}{16} \times 7\frac{5}{8}$	$7\frac{5}{8} \times 6\frac{11}{16}$
$27 \times 10\frac{1}{8}$	$20\frac{1}{4} \times 13\frac{1}{2}$	$20\frac{1}{4} \times 6\frac{3}{4}$	$13\frac{1}{2} \times 10\frac{1}{8}$	$13\frac{1}{2} \times 6\frac{3}{4}$	$13\frac{1}{2} \times 6\frac{3}{4}$	$10\frac{1}{8} \times 6\frac{3}{4}$	$6\frac{3}{4} \times 5\frac{1}{16}$
$26 \times 8\frac{3}{8}$	$16\frac{3}{4} \times 13$	$16\frac{3}{4} \times 6\frac{1}{2}$	$13 \times 8\frac{3}{8}$	$13 \times 5\frac{7}{12}$	$11\frac{1}{6} \times 6\frac{1}{2}$	$8\frac{3}{8} \times 6\frac{1}{2}$	$6\frac{1}{2} \times 4\frac{3}{8}$
$22 \times 7\frac{5}{8}$	$15\frac{1}{4} \times 11$	$15\frac{1}{4} \times 5\frac{1}{2}$	$11 \times 7\frac{5}{8}$	$11 \times 5\frac{1}{2}$	$10\frac{1}{6} \times 5\frac{1}{2}$	$7\frac{5}{8} \times 5\frac{1}{2}$	$5\frac{1}{2} \times 3\frac{1}{8}$
$19\frac{1}{2} \times 6\frac{3}{4}$	$13\frac{1}{2} \times 9\frac{3}{4}$	$13\frac{1}{2} \times 4\frac{7}{8}$	$9\frac{3}{4} \times 6\frac{3}{4}$	$9\frac{3}{4} \times 4\frac{1}{2}$	$9 \times 4\frac{7}{8}$	$6\frac{3}{4} \times 4\frac{7}{8}$	$4\frac{7}{8} \times 3\frac{3}{8}$
$19\frac{1}{2} \times 6$	$12 \times 9\frac{3}{4}$	$12 \times 4\frac{7}{8}$	$9\frac{3}{4} \times 6$	$9\frac{3}{4} \times 4$	$8 \times 4\frac{7}{8}$	$6 \times 4\frac{7}{8}$	$4\frac{7}{8} \times 3$
$17\frac{1}{2} \times 5\frac{1}{2}$	$11 \times 8\frac{3}{4}$	$11 \times 4\frac{3}{8}$	$8\frac{3}{4} \times 5\frac{1}{2}$	$8\frac{3}{4} \times 3\frac{3}{8}$	$7\frac{1}{2} \times 4\frac{3}{8}$	$5\frac{1}{2} \times 4\frac{3}{8}$	$4\frac{3}{8} \times 2\frac{3}{4}$
$15\frac{1}{2} \times 5$	$10 \times 7\frac{3}{4}$	$10 \times 3\frac{7}{8}$	$7\frac{3}{4} \times 5$	$7\frac{3}{4} \times 3\frac{1}{3}$	$6\frac{2}{3} \times 3\frac{7}{8}$	$5 \times 3\frac{7}{8}$	$3\frac{7}{8} \times 1\frac{5}{8}$

## VII.—Table of Sizes of Printing and Writing

DESCRIPTION,	Broad side.	Long folio.	Long thirds.	Long fourths.	Broad folio.	Broad thirds.
--------------	-------------	-------------	--------------	---------------	--------------	---------------

## PRINTING

Double Super Royal . . .	41 x 27½	41 x 13½	41 x 9½	41 x 6½	27½ x 20½	27½ x 13½
Do. Royal . . .	40 x 25	40 x 12½	40 x 8½	40 x 6½	25 x 20	25 x 13½
Do. Demy . . .	35 x 22½	35 x 11½	35 x 7½	35 x 5½	22½ x 17½	22½ x 11½
Imperial . . .	30 x 22	30 x 11	30 x 7½	30 x 5½	22 x 15	22 x 10
Double Crown . . .	30 x 20	30 x 10	30 x 6½	30 x 5	20 x 15	20 x 10
Super Royal . . .	28½ x 21½	28½ x 10½	28½ x 7½	28½ x 5½	21½ x 14½	21½ x 9½
Double Foolscap . . .	27 x 17	27 x 8½	27 x 5½	27 x 4½	17 x 13½	17 x 9
Royal . . .	25 x 20	25 x 10	25 x 6½	25 x 5	20 x 12½	20 x 8½
Medium . . .	24 x 19	24 x 9½	24 x 6½	24 x 4½	19 x 12	19 x 8
Demy . . .	22½ x 18	22½ x 9	22½ x 6	22½ x 4½	18 x 11½	18 x 7½
Crown . . .	20 x 15	20 x 7½	20 x 5	20 x 3½	15 x 10	15 x 6½
Foolscap . . .	17 x 13½	17 x 6½	17 x 4½	17 x 3½	13½ x 8½	13½ x 5½

## WRITING

Imperial . . . .	30 x 22	30 x 11	30 x 7½	30 x 5½	22 x 15	22 x 10
Super Royal H. M. B. L. .	27 x 19½	27 x 9½	27 x 6½	27 x 4½	19½ x 13½	19½ x 9
Royal H. M. B. L. .	24½ x 19½	24½ x 9½	24½ x 6½	24½ x 4½	19½ x 12½	19½ x 8½
Do. H. M. . . .	24 x 19½	24 x 9½	24 x 6½	24 x 4½	19½ x 12	19½ x 8
Medium H. M. B. L. .	22 x 17½	22 x 8½	22 x 5½	22 x 4½	17½ x 11	17½ x 7½
Do. M. M. B. L. .	22½ x 17½	22½ x 8½	22½ x 5½	22½ x 4½	17½ x 11½	17½ x 7½
Demy H. M. B. L. .	20 x 15½	20 x 7½	20 x 5½	20 x 3½	15½ x 10	15½ x 6½
Do. M. M. B. L. .	20½ x 15½	20½ x 7½	20½ x 5½	20½ x 3½	15½ x 10½	15½ x 6½
Double Foolscap M. M. .	27 x 17	27 x 8½	27 x 5½	27 x 4½	17 x 13½	17 x 9
Foolscap H. M. B. L. .	17 x 13½	17 x 6½	17 x 4½	17 x 3½	13½ x 8½	13½ x 5½
Do. M. M. . . .	16½ x 13½	16½ x 6½	16½ x 4½	16½ x 3½	13½ x 8½	13½ x 5½

Papers and their Principal Subdivisions—*continued.*

Long quarto.	Broad quarto.	Long octavo.	Common octavo.	Long 12mo.	Common 12mo.	16mo.	32mo.
--------------	---------------	--------------	----------------	------------	--------------	-------	-------

## PAPERS.

$27\frac{1}{2} \times 10\frac{1}{4}$	$20\frac{1}{2} \times 13\frac{3}{4}$	$20\frac{1}{2} \times 6\frac{7}{8}$	$13\frac{3}{4} \times 10\frac{1}{4}$	$13\frac{3}{4} \times 6\frac{5}{8}$	$13\frac{3}{8} \times 6\frac{7}{8}$	$10\frac{1}{4} \times 6\frac{7}{8}$	$6\frac{7}{8} \times 5\frac{1}{8}$
$25 \times 10$	$20 \times 12\frac{1}{2}$	$20 \times 6\frac{1}{4}$	$12\frac{1}{2} \times 10$	$12\frac{1}{2} \times 6\frac{5}{8}$	$13\frac{3}{8} \times 6\frac{1}{4}$	$10 \times 6\frac{1}{4}$	$6\frac{1}{4} \times 5$
$22\frac{1}{2} \times 8\frac{3}{4}$	$17\frac{1}{2} \times 11\frac{1}{4}$	$17\frac{1}{2} \times 5\frac{5}{8}$	$11\frac{1}{4} \times 8\frac{3}{4}$	$11\frac{1}{4} \times 5\frac{5}{8}$	$11\frac{2}{3} \times 5\frac{5}{8}$	$8\frac{3}{4} \times 5\frac{5}{8}$	$5\frac{5}{8} \times 4\frac{5}{8}$
$22 \times 7\frac{1}{2}$	$15 \times 11$	$15 \times 5\frac{1}{2}$	$11 \times 7\frac{1}{2}$	$11 \times 5$	$10 \times 5\frac{1}{2}$	$7\frac{1}{2} \times 5\frac{1}{2}$	$5\frac{1}{2} \times 3\frac{3}{4}$
$20 \times 7\frac{1}{2}$	$15 \times 10$	$15 \times 5$	$10 \times 7\frac{1}{2}$	$10 \times 5$	$10 \times 5$	$7\frac{1}{2} \times 5$	$5 \times 3\frac{5}{8}$
$21\frac{1}{2} \times 7\frac{1}{8}$	$14\frac{1}{4} \times 10\frac{3}{4}$	$14\frac{1}{4} \times 5\frac{5}{8}$	$10\frac{3}{4} \times 7\frac{1}{8}$	$10\frac{3}{4} \times 4\frac{3}{4}$	$9\frac{1}{2} \times 5\frac{3}{8}$	$7\frac{1}{8} \times 5\frac{3}{8}$	$5\frac{3}{8} \times 3\frac{9}{16}$
$17 \times 6\frac{3}{4}$	$13\frac{1}{2} \times 8\frac{1}{2}$	$13\frac{1}{2} \times 4\frac{1}{4}$	$8\frac{1}{2} \times 6\frac{3}{4}$	$8\frac{1}{2} \times 4\frac{1}{2}$	$9 \times 4\frac{1}{4}$	$6\frac{3}{4} \times 4\frac{1}{4}$	$4\frac{1}{4} \times 3\frac{5}{8}$
$20 \times 6\frac{1}{4}$	$12\frac{1}{2} \times 10$	$12\frac{1}{2} \times 5$	$10 \times 6\frac{1}{4}$	$10 \times 4\frac{1}{6}$	$8\frac{1}{2} \times 5$	$6\frac{1}{4} \times 5$	$5 \times 3\frac{5}{8}$
$19 \times 6$	$12 \times 9\frac{1}{2}$	$12 \times 4\frac{3}{4}$	$9\frac{1}{2} \times 6$	$9\frac{1}{2} \times 4$	$8 \times 4\frac{3}{4}$	$6 \times 4\frac{3}{4}$	$4\frac{3}{4} \times 3$
$18 \times 5\frac{9}{16}$	$11\frac{1}{8} \times 9$	$11\frac{1}{8} \times 4\frac{1}{2}$	$9 \times 5\frac{9}{16}$	$9 \times 3\frac{1}{2}\frac{7}{8}$	$7\frac{1}{2} \times 4\frac{1}{2}$	$5\frac{9}{16} \times 4\frac{1}{2}$	$4\frac{1}{2} \times 2\frac{5}{8}\frac{5}{8}$
$15 \times 5$	$10 \times 7\frac{1}{2}$	$10 \times 3\frac{3}{4}$	$7\frac{1}{2} \times 5$	$7\frac{1}{2} \times 3\frac{1}{3}$	$6\frac{2}{3} \times 3\frac{3}{4}$	$5 \times 3\frac{3}{4}$	$3\frac{3}{4} \times 2\frac{1}{2}$
$13\frac{1}{2} \times 4\frac{1}{4}$	$8\frac{1}{2} \times 6\frac{3}{4}$	$8\frac{1}{2} \times 3\frac{5}{8}$	$6\frac{3}{4} \times 4\frac{1}{4}$	$6\frac{3}{4} \times 2\frac{5}{6}$	$5\frac{2}{3} \times 3\frac{3}{8}$	$4\frac{1}{4} \times 3\frac{3}{8}$	$3\frac{3}{8} \times 2\frac{1}{8}$

## PAPERS.

$22 \times 7\frac{1}{2}$	$15 \times 11$	$15 \times 5\frac{1}{2}$	$11 \times 7\frac{1}{2}$	$11 \times 5$	$10 \times 5\frac{1}{2}$	$7\frac{1}{2} \times 5\frac{1}{2}$	$5\frac{1}{2} \times 3\frac{5}{8}$
$19\frac{1}{4} \times 6\frac{3}{4}$	$13\frac{1}{2} \times 9\frac{5}{8}$	$13\frac{1}{2} \times 4\frac{13}{16}$	$9\frac{5}{8} \times 6\frac{3}{4}$	$9\frac{5}{8} \times 4\frac{1}{2}$	$9 \times 4\frac{13}{16}$	$6\frac{5}{8} \times 4\frac{13}{16}$	$4\frac{13}{16} \times 3\frac{5}{8}$
$19\frac{1}{2} \times 6\frac{1}{16}$	$12\frac{1}{8} \times 9\frac{3}{4}$	$12\frac{1}{8} \times 4\frac{7}{8}$	$9\frac{3}{4} \times 6\frac{1}{16}$	$9\frac{3}{4} \times 4\frac{1}{2}\frac{1}{4}$	$8\frac{1}{2} \times 4\frac{7}{8}$	$6\frac{1}{16} \times 4\frac{7}{8}$	$4\frac{7}{8} \times 3\frac{1}{32}$
$19\frac{1}{2} \times 6$	$12 \times 9\frac{3}{4}$	$12 \times 4\frac{7}{8}$	$9\frac{3}{4} \times 6$	$9\frac{3}{4} \times 4$	$8 \times 4\frac{7}{8}$	$6 \times 4\frac{7}{8}$	$4\frac{7}{8} \times 3$
$17\frac{1}{4} \times 5\frac{1}{2}$	$11 \times 8\frac{5}{8}$	$11 \times 4\frac{5}{16}$	$8\frac{5}{8} \times 5\frac{1}{2}$	$8\frac{5}{8} \times 3\frac{3}{8}$	$7\frac{1}{8} \times 4\frac{5}{16}$	$5\frac{1}{2} \times 4\frac{5}{16}$	$4\frac{5}{16} \times 2\frac{5}{8}$
$17\frac{3}{4} \times 5\frac{5}{8}$	$11\frac{1}{4} \times 8\frac{7}{8}$	$11\frac{1}{4} \times 4\frac{7}{16}$	$8\frac{7}{8} \times 5\frac{5}{8}$	$8\frac{7}{8} \times 3\frac{3}{4}$	$7\frac{1}{2} \times 4\frac{7}{16}$	$5\frac{5}{8} \times 4\frac{7}{16}$	$4\frac{7}{16} \times 2\frac{5}{8}$
$15\frac{3}{4} \times 5$	$10 \times 7\frac{7}{8}$	$10 \times 3\frac{15}{16}$	$7\frac{7}{8} \times 5$	$7\frac{7}{8} \times 3\frac{1}{2}$	$6\frac{2}{3} \times 3\frac{15}{16}$	$5 \times 3\frac{15}{16}$	$3\frac{15}{16} \times 2\frac{1}{2}$
$15\frac{1}{2} \times 5\frac{1}{16}$	$10\frac{1}{8} \times 7\frac{3}{4}$	$10\frac{1}{8} \times 3\frac{7}{8}$	$7\frac{3}{4} \times 5\frac{1}{16}$	$7\frac{3}{4} \times 3\frac{3}{8}$	$6\frac{3}{4} \times 3\frac{7}{8}$	$5\frac{1}{16} \times 3\frac{7}{8}$	$3\frac{7}{8} \times 2\frac{17}{16}$
$17 \times 6\frac{3}{4}$	$13\frac{1}{2} \times 8\frac{1}{2}$	$13\frac{1}{2} \times 4\frac{1}{4}$	$8\frac{1}{2} \times 6\frac{3}{4}$	$8\frac{1}{2} \times 4\frac{1}{2}$	$9 \times 4\frac{1}{4}$	$6\frac{3}{4} \times 4\frac{1}{4}$	$4\frac{1}{4} \times 3\frac{5}{8}$
$13\frac{1}{2} \times 4\frac{1}{4}$	$8\frac{1}{2} \times 6\frac{3}{4}$	$8\frac{1}{2} \times 3\frac{5}{8}$	$6\frac{3}{4} \times 4\frac{1}{4}$	$6\frac{3}{4} \times 2\frac{5}{6}$	$5\frac{2}{3} \times 3\frac{3}{8}$	$4\frac{1}{4} \times 3\frac{3}{8}$	$3\frac{3}{8} \times 2\frac{1}{8}$
$13\frac{1}{4} \times 4\frac{1}{8}$	$8\frac{1}{4} \times 6\frac{5}{8}$	$8\frac{1}{4} \times 3\frac{5}{16}$	$6\frac{5}{8} \times 4\frac{1}{8}$	$6\frac{5}{8} \times 2\frac{3}{4}$	$5\frac{1}{2} \times 3\frac{5}{16}$	$4\frac{1}{8} \times 3\frac{5}{16}$	$3\frac{5}{16} \times 2\frac{1}{16}$

VIII.—Table for Calculating the Areas of Negatives and Prints in Square Inches.

NOS. OF NEGATIVES.	SIZE IN INCHES.														
	32 x 24	30 x 24	24 x 17	22 x 20	22 x 18	22 x 16	20 x 18	20 x 15	18 x 16	17 x 14	16 x 13	15 x 12	12 x 10	10 x 8	9 x 7
1	768	720	498	440	396	352	360	300	288	238	208	180	120	80	63
2	1,536	1,440	816	880	792	704	720	600	576	476	416	360	240	160	126
3	2,304	2,160	1,224	1,320	1,188	1,056	1,080	900	864	714	624	540	360	240	189
4	3,072	2,880	1,632	1,760	1,584	1,408	1,440	1,200	1,152	952	832	720	480	320	252
5	3,840	3,600	2,040	2,200	1,980	1,760	1,800	1,500	1,440	1,190	1,040	900	600	400	315
6	4,608	4,320	2,448	2,640	2,376	2,112	2,160	1,800	1,728	1,428	1,248	1,080	720	480	378
7	5,376	5,040	2,856	3,080	2,772	2,464	2,520	2,100	2,016	1,666	1,456	1,260	840	560	441
8	6,144	5,750	3,264	3,520	3,168	2,816	2,880	2,400	2,304	1,904	1,664	1,440	960	640	504
9	6,912	6,480	3,672	3,960	3,564	3,168	3,240	2,700	2,592	2,142	1,872	1,620	1,080	720	567
10	7,680	7,200	4,080	4,400	3,960	3,520	3,600	3,000	2,880	2,380	2,080	1,800	1,200	800	630

**IX.—Representative Fractions corresponding to the Scales of Maps published by the Survey of India Department.**

Scale.	Representative Fraction.	Scale.	Representative Fraction.
1 Inch = 256 Miles .	$\frac{1}{16,220,160.}$	1 Inch = 2 Miles	$\frac{1}{126,720.}$
1 Inch = 128 Miles .	$\frac{1}{8,110,080.}$	1 Inch = 1 Mile	$\frac{1}{63,360.}$
1 Inch = 96 Miles .	$\frac{1}{6,082,560.}$	2 Inches = 1 Mile	$\frac{1}{31,680.}$
1 Inch = 80 Miles .	$\frac{1}{5,068,800.}$	3 Inches = 1 Mile	$\frac{1}{21,120.}$
1 Inch = 64 Miles .	$\frac{1}{4,055,040.}$	4 Inches = 1 Mile	$\frac{1}{15,840.}$
1 Inch = 50 Miles .	$\frac{1}{3,168,000.}$	5 Inches = 1 Mile	$\frac{1}{12,672.}$
1 Inch = 48 Miles .	$\frac{1}{3,041,280.}$	6 Inches = 1 Mile	$\frac{1}{10,560.}$
1 Inch = 32 Miles .	$\frac{1}{2,027,520.}$	8 Inches = 1 Mile	$\frac{1}{7,920.}$
1 Inch = 24 Miles .	$\frac{1}{1,520,640.}$	10 Inches = 1 Mile	$\frac{1}{6,336.}$
1 Inch = 16 Miles .	$\frac{1}{1,013,760.}$	12 Inches = 1 Mile	$\frac{1}{5,280.}$
1 Inch = 12 Miles .	$\frac{1}{760,320.}$	16 Inches = 1 Mile	$\frac{1}{3,960.}$
1 Inch = 8 Miles .	$\frac{1}{506,880.}$	20 Inches = 1 Mile	$\frac{1}{3,168.}$
1 Inch = 6 Miles .	$\frac{1}{380,160.}$	24 Inches = 1 Mile	$\frac{1}{2,640.}$
1 Inch = 4 Miles .	$\frac{1}{253,440.}$	30 Inches = 1 Mile	$\frac{1}{2,112.}$
Atlas of India . .	$\frac{1}{255,561.}$	32 Inches = 1 Mile	$\frac{1}{1,980.}$

